PROJECT NUMBER: 1806
PROJECT TITLE: New Tobacco Processes
SECTION LEADER: S. R. Wagoner
PERIOD COVERED: April, 1988

I. PROJECT ART - PILOT PLANT SUPPORT

A. **Objective**: To provide processes for converting and casing stem materials for the Bermuda Hundred Pilot Plant.

B. **Results**: Batches of Louisville rolled/cut stems and shredded stems were cased with monopotassium citrate to various citrate and moisture levels and shipped to the Bermuda Hundred Pilot Plant.

C. **Plans**: Continue to produce stem products as required by Project ART. Complete the installation of the CRS line in D Pilot Plant so that variables such as cut width can be tested at BHPP.

II. PROJECT ART - COMMERCIAL PROCESS DEVELOPMENT

A. **Objective**: To conduct trials providing information for development of the ART commercial process.

B. **Results**: Baseline evaluation of the Dickinson Admoist conditioner was completed by determining the conditioning potential of the unit as measured by OV and temperature gains. Statistical testing, at the typical Pilot Plant stem throughput of 1000 lb/hr, identified the impact of each operating variable: steam pressure to the sparge tube, steam pressure to the water nozzles, water flow to the nozzles, and residence time. Analysis of the data has shown that the exit stem temperature is primarily a function of the steam pressure to the sparge tube, while OV gain is directly related to the water flow rate and residence time. A production rate (~6000 lb/hr) simulation test was successfully conducted, conditioning whole stems from 28 to 31.5% OV with an average exit stem temperature of 195°F. A mechanical loading test was also run by lowering the angle of the Admoist such that the unit retained approximately the weight (500 lb) of stems that it will in production. This test was run for four hours and no significant processing problems were encountered.

The Admoist conditioner and the Quester steam tunnel were evaluated for post-ART filler treatment, i.e., elimination of clumps and effect on subjective response. For the Admoist trial, no judgement could be made on the unit's ability to declump filler, since the extraction run failed to produce clumps in the feed material. The treated filler will be chemically and subjectively evaluated to determine the effect of conditioning on the ammonia level. The Quester tunnel was unsuccessful in eliminating clumps in the post-ART filler. This filler will also be evaluated for subjective and chemical effects.

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Subjective testing of the post-ART stems (CRS) that were processed into superheated IS in Louisville indicated a tendency toward reduced liking scores when compared to the control IS at 5% levels in a Marlboro configuration. Initial comparisons in PM Superlights showed similar results. Further testing is in progress to confirm these findings.

C. **Plans**: Conduct trials to determine the optimum method (pneumatic, screening) of separating clumps from post-ART filler, such that, the clumps can be treated as a sidestream process.

Conduct subjective evaluations of post-ART stems at lower potassium citrate levels and using alternate casings, such as citric acid.

III. BINDER DEVELOPMENT

A. **Objective**: Develop methods to produce binder systems for the foam bound rod, bonded ends, and low density rod programs.

B. **Results**: Preliminary subjective testing of cigarettes using a NaCMC/licorice binder system has been positive in Engineering's bonded ends program. A meeting was held with a representative of Aqualon to discuss various forms of CMC. Samples of Ca, Mg, and K CMC will be received for comparison testing versus NaCMC.

Meetings were held with A. Henriksen of PM Australia and A. Schwarb of FTR to discuss the foam bound rod program. Test results and QA specifications for pectins and maltodextrins were presented.

Propyl paraben results from the second preapplied binder tracer trial were received from General Analytical. Again, the data showed approximately half of the paraben was found on the tobacco. In addition, only half of the paraben was detected on the samples that were hand sprayed with a propyl paraben spiked pectin solution. Plans include using fucose as a tracer.

C. **Plans**: Continue to provide support as required to the above programs.

IV. TMCI-ASTA SHEET

A. **Objective**: To develop a subjectively and physically acceptable reconstituted tobacco sheet using the TMCI process and PM-RCB technology for international application.

B. **Results**: The Tarragona ASTA trials are scheduled to begin on May 9th and will take approximately three weeks to complete. Laboratory evaluation of more finely ground dust (<400 mesh) than specified by TMCI (<60 mesh) demonstrated improved sheet quality. The slurry viscosity of this finer dust with PM binder was reduced which improved casting uniformity. The sheet had a translucent appearance which indicates improved pectin release and it

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contained very few pinholes which should improve filler survivability through primary processing. Some differences in humectant analysis between PM and USA were identified and a PM analyst was sent to TSA laboratories in Madrid to resolve the differences before the trials begin in Tarragona.

C. **Plans**:

1. Complete the series of ASTA trials including evaluation of finer tobacco particle size in May.

2. Identify and evaluate the best ASTA product candidates for physical and subjective characteristics in USA by the end of August.

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